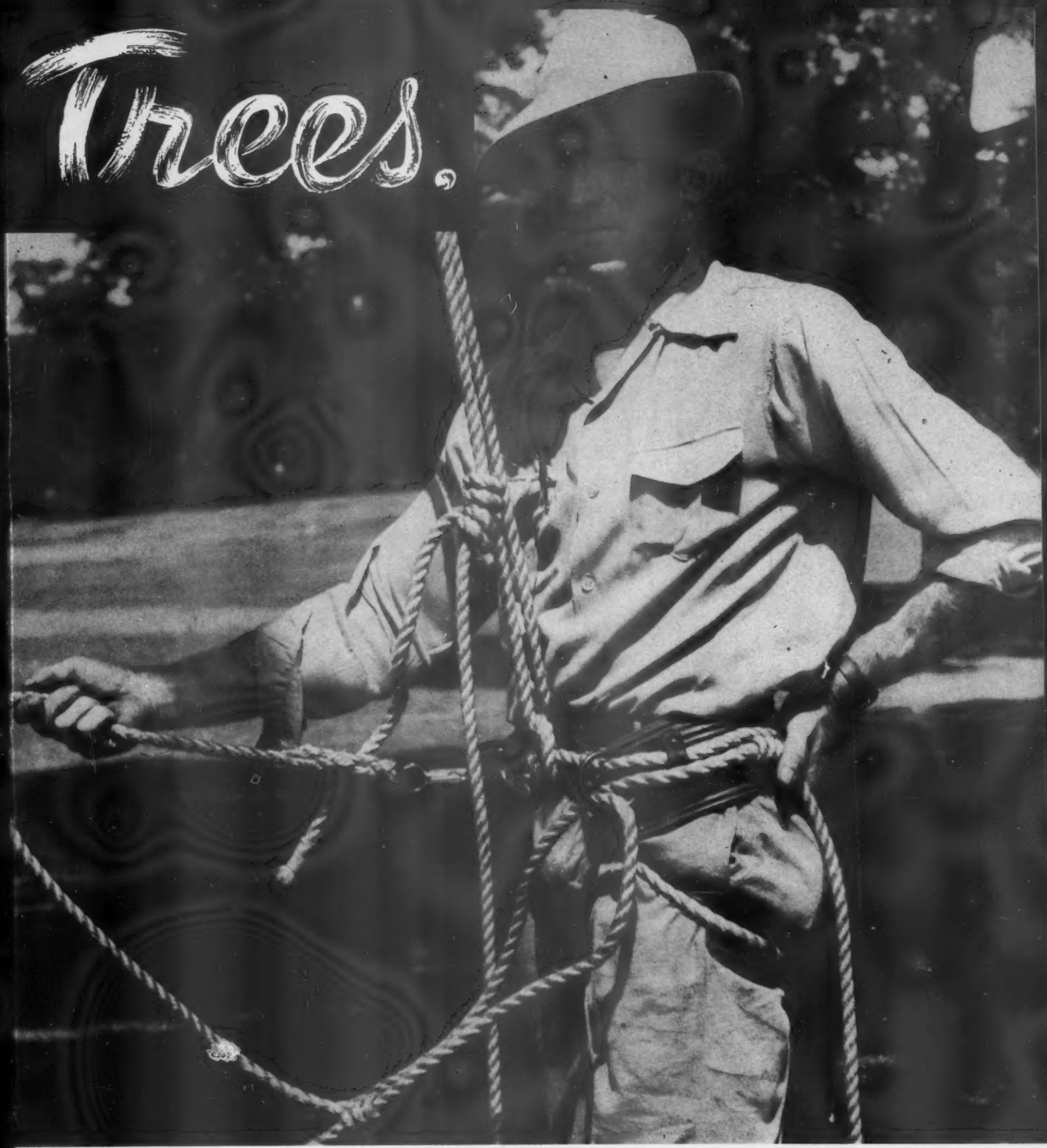
Trees.



The Treeman's Gear—Prize Winning Photo—(Page 16)

Chemotherapy of Dutch Elm Disease — ***A. E. Dimond, et al***

Arborist Training Program — ***Rhodell E. Owens***

. Sept.-Oct., 1947 *The Journal of American Arboriculture* Vol. 7—No. 6

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ALONG THE WAY

With . . . EDW. SCANLON

• Now HERE'S A BOY with a thought that KINDA GIVES me ITCHY FEET—the ZERBY TREE SERVICE'S Mr. W. H., with the LAST NAME being the FIRST NAME OF THE aforementioned enterprise, WOULD LIKE A CONTACT with a SOUTHERN ARBORIST to, as he put it, "KEEP OUT OF THE SNOW AND ICE" (599 So. Main St., Mansfield, Ohio). Shouldn't have MUCH TROUBLE, ZERB I understand THEY'RE CRYING FOR GOOD men in MAMMY LAND.

• *Just so YOU WON'T FORGET, let me REMIND YOU that it was HOT AT THE NATIONAL SHADE TREE CONFERENCE—or, do you REMEMBER.*

• Being on a CONFERENCE COMMITTEE, in addition to BEING NOTHING EXCEPT WORK, has another DRAWBACK—when the meeting is over YOU KNOW NOTHING THAT TRANSPIRED. Had to ask PAUL TILFORD to write the story of the meeting.

• *LARRY WACHTEL gets the General Chairman baton for the MILWAUKEE MEETING NEXT YEAR, and as far as CHARLIE IRISH is concerned, he can have it. GOOD LUCK LARRY, we'll all be PULLING ALONG to help make Milwaukee BIGGER AND BETTER. Let's start now.*

• Our SINCERE WISHES go out to PAL STARNER of SCARSDALE, N. Y., who lost the TIPS OF A COUPLE "PINKIES" in a SPRAYER DEMONSTRATION, and that he has suffered NO MORE SERIOUS CONSEQUENCES.

• *Saw my FIRST FRANKLINIA in bloom several weeks. WOTTA SIGHT. This lovely FALL BLOOMING (Sept. into Oct.) should be PLANTED WHEREVER it will grow. LIKES ACID.*

• TED JANOSKO and JOHNNIE STASHENKO (sounds like a couple of VODKA SALESMEN from THE UKRAINE) were the "PEST CONTROL" kids of the conference—nobody COULD CONTROL THEM.

• *HARRY NELSON, Div. of Hort., SAN FRANCISCO: J. C. drops a note ABOUT THE NICE new everything and other the dept. is getting. AN $81,000 BUILDING program which INCLUDES GREENHOUSE, bath house and PLENTY OF SPACE.*

• WINNERS of the FIRST PHOTOGRAPHIC contest at a SHADE TREE CONFERENCE were, first the GALLOPING CHEVROLET JOCKEY from Lansing, CARL O'FENNER. His masterpiece GRACES THE COVER of this issue, and shows the SKINNERS SADDLE HITCHES, whereby butchering is made COMPARATIVELY SAFE. The second prize was T. D. NEIL of KUEMMERLING ENTERPRIZES, CANTON, O. Third prize went to JOHNNY MICHALKO, of the CLEVELAND DIVISION OF SHADE TREES, who had the temerity to take a picture of a TUSSOCK MOTH larvae—after we looked at 38 TRILLION of them this year. There were 25 ENTRANTS in THE CONTEST.

• *The 173 DELEGATES who went to the ball game AT THE STADIUM, while they SWELTERED IN THE PROCESS, saw the Indians win TWO VERY BEAUTIFULLY PLAYED ball games. How do you like those BOUDREAU AND GORDON double plays around second? VERY CUTE!*

• Got some NICE KODACHROMES of a beautiful GOLDENRAIN in bloom around AUG. 15th. A LOVELY TREE and tough —can take city life. MORE STREETS should be PLANTED TO THEM.

• *Have a street of SOPHORA JAPONICA in Cleveland, planted last spring, that is DOING REAL WELL. Also a street of* QUERCUS SERRATA (Oriental oak) and *about FIVE OF WHEATLEY ELM. Coming nicely.*

• On our vacation AFTER THE CONFERENCE, the little woman DEVELOPED A TOOTHACHE that threatened to TEAR HER HEAD off. Stopped in to see RUSS O'NEIL and GEORGE BLAIR (Consumers Power Co.) at JACKSON, MICH., and they STEERED US TO A DOC who fixed the MOLAR SO WELL it hasn't MURMURED SINCE. Thanks kids.

• *N. G. GILBERT of the SUPERIOR TREE EXPERT CO., Inc., P. O. Box 949, MUNCIE, IND., has an E. C. ATKINS ELECTRIC CHAIN SAW for sale. Attachments, all in FIRST CLASS CONDITION, include 200' cable and 4-cyl. gas motor and generator MOUNTED ON A TWO-WHEEL TRAILER. One 4' guide bar with 2 CHAINS and one 6' guide bar with 2 CHAINS. Very cheap, or at LEAST REASONABLE.*

• WHAT HAPPENED to that ball game AT THE CONFERENCE—or was it too hot to play. With all the BRAGGING ED CONNELL and those other CONNECTICUT YANKEES were putting out IT LOOKED like they would FORCE THE ISSUE. But maybe they figured more "HOT AIR" wouldn't GO OVER SO GOOD.

• *Summer sure went OUT ON SCHEDULE Tuesday, September 23rd, we had a nice day WHEN ALL OF A SUDDEN, BANG —down went the MERCURY and we made a frantic GRAB FOR THE ITCHY REDS. It won't be long now. Oh! YOU LUCKY CAL-I-FOR-NIA LADS.*

• Had MUCH TOO LITTLE TIME to chew over D E D with AL DIMOND, CONN. AGR. STATION—MIST SPRAYING with FRED POTTS, U. S. D. A., and TREE BREEDING with ERNST SCHREINER, Forest Service. LETS HAVE A QUIET CONFERENCE some day, so we CAN TALK.

• *IT SEEMS TO ME I saw LOUIE CHADWICK at the Conference—AT LEAST THE GUY who hovered so lovingly AROUND THE CASH BOX looked like him.*

• AEX McRAE had to leave early. Sure you didn't GO BACK TO N. C. to cool off ALEX?

• *GEORGE KELLY, editor of "GREEN THUMB," Denver, Colo., WAS A WELCOME newcomer to the conference. GEORGE is horticulturist for the COLORADO FORESTRY AND HORTICULTURE ASSOCIATION. Bet those OLD ROCKIES felt good when you got home GEORGE!*

• MAURICE MARSHALL was another Denverite present—BOB DYE of Seattle, Wash., ROGER SOHNER and KEITH DAVEY of San Francisco were other FAR-AWAYERS.

• *FIGURE IT OUT—25% of the H. C. L. today can be attributed to MONEY HUNGRY SLOBS who have taken ADVANTAGE OF THE TIMES to gouge and chisel. HUNTING SEASON opens soon.*

• DON'T FORGET THE ADVERTISERS little chums; keep on patronizing the OLD STANDBYS and give the NEW ONES all the breaks you can. THERE'S PLENTY OF BUSINESS in the field to warrant HEALTHY SUPPORT of TREES and the NATIONAL SHADE TREE CONFERENCE. Through such support THE FIELD GROWS, becomes more STABLE and needs MORE SUPPLIES.

• *One place I WANT TO SEE FOR SURE next spring is VALLEY FORGE and the GORGEOUS DOGWOODS. JACK KENEALY make a note please and say WHEN THEY ARE TOPS.*

• TED MATHIEU and LLOYD BEAL did quite a yeoman SERVICE POUNDING the ivories at the banquet. IN SPITE of the heat the ENTERTAINMENT WAS PRONOUNCED as the best seen in the CLEVELAND HOTEL.

• *HARVEY BICKNELL did such a swell job with his "GET ACQUAINTED LUNCHEON" for the ladies at the CLEVELAND GARDEN CENTER that its a cinch to be a fixture at FUTURE MEETINGS.*

• ALL IN ALL the 23rd NSTC was fun and education in spite of the heat. WE IN CLEVELAND are glad you all came, SORRY SOME STAYED AWAY, but there is ALWAYS ANOTHER YEAR and you will never be sorry, REGARDLESS, if you attend the NATIONAL SHADE TREE CONFERENCE—if you fail TO GET ANY THING out of it, I'd say it was YOUR OWN FAULT.

ADIOS AMIGOS.

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Vol. 7 Bi-Monthly No. 6

Subscription Price $2.00 Per Year (Foreign $2.50) 35 Cents Per Copy Box 5607, Cleveland, Ohio

The Editors of TREES invite discussions, comments and all types of literary materials pertaining to trees and tree preservation from any person engaged either in the scientific advancement or commercial development of the field.

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Sept.-Oct., 1947 **Journal of the National Arborist Association** Vol. 7—No. 6

EDWARD H. SCANLON, Editor
Box 5607, Cleveland, Ohio
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Out on a Limb

FIGHTING CONSERVATION ORGANIZATION NEEDED?

Dutch elm disease, phloem necrosis, cankerstain of planes and other serious diseases of shade trees continue to make gaping inroads into the tree population of the nation. Practically nothing is being done to stop these destroyers. Several very able scientists are working devotedly with insufficient funds and help to stem a tide that is surging far beyond their valiant efforts. It is not enough. We must have the resources of this great government of ours.

The greatest country in the world is permitting its government to flit about the world putting out fires here and there, while in the attic, home fires are raging unhindered.

The tragedy of our shade trees is not the only example of the demagogic mien that has been assumed by our now world-embracing diplomats, but the more one looks around and observes the manner in which the paint is cracking off the old barn at home the more difficult it becomes to swallow the big, bitter looking international pill they have been trying to coat with sugar for the past too many years.

It has never been considered selfish or unneighborly to patch your own roof and then help your neighbor, but now they're trying to make you out a hog if you do. Be that as it may, it's still good horse sense, which seems also to have had a decline since the advent of the automobile.

Maybe the failure to recognize and do something about the home front cultural necessities, as pertains to our trees, can be blamed on the ineptness of some of the organizations with large lay memberships. They do not seem to be very effective. A meeting of some of the aggressive thinkers might be in order to devise ways and means of launching a new organization that would show some initiative and punch and not be so stodgy and staid.

Dignity is nice but Dutch elm disease does not recognize it. Only action will solve our troubles.

NATIONAL SHADE TREE CONFERENCE TO MILWAUKEE

At the recent National Shade Tree Conference in Cleveland the members voted to hold the 1948 meeting in Milwaukee.

This is a commendable and wise decision. The middle west is rapidly becoming an important scene of arboricultural activities and many of the operators are not familiar with the conference and its fine record, its future, and the benefits that can be reaped by participants in the activities of the organization.

Larry Wachtel of Wauwatosa, Wis., is general chairman of the 1948 convention. We should all get behind Larry NOW and start working to make the Milwaukee meeting a memorable one.

Electra Provides Management Service to Arborists

In an outstanding campaign introducing arborists to a new and highly profitable department, which is closely allied with the arborists normal work, Mr. Howard L. Hutchins, manager of the Wholesale Division of the Electra Protection Co., Inc., 11 North Pearl Street, Albany, New York, and factory representative of the Independent Protection Company, manufacturers, has been working on plans and dealer aids that are of great interest to every progressive arborist. This new profitable, department for arborists is—Lightning Protection Installations for Trees.

Mr. Hutchins estimates that the average person can take the primary tree protection manual, and after devoting an hour and a half of study and working out of examples, he would know just how to protect any species of tree. The manuals include all that is necessary for proper installation and estimating of jobs for tree protection.

Other dealer aids and management service includes advertising and promotional material, charts and budgeted figures showing profit potentials, check lists of dealer services, profit and expense controls, on the job training outlines, sales literature and other dealer helps, pre-arranged trips and training programs at the home office in Albany, New York, including sightseeing of installation crews on the scene sales training program and many other like services. Mr. Hutchins has been greatly assisted in this unusual business engineering survey by Jerome L. Gibe & Associates, consulting management engineers, who also maintain an office in Albany, New York. New management services of profitable interest to the arborist are being worked upon. We suggest to every arborist that he write Mr. Hutchins, so that his name and address may be placed on the Electra mailing list.

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Elms Resistant to Disease Growing in U. S. A.

It is possible that foreign elms, resistant or immune to the fatal Dutch elm disease, may be raised in large numbers in this country to replace American elms killed by the disease, according to Dr. Ray R. Hirt, forest pathologist at the New York State College of Forestry at Syracuse University.

American scientists in the Federal Division of Forest Pathology for many years have been investigating the possibility of developing desirable hybrid elms resistant to the Dutch elm diseases. During these studies an elm known as the "Christine Buisman Elm" was imported into the United States from the Netherlands where the disease was first discovered. This elm was resistant to the disease in Europe and has continued so in this country.

In the government experiment area at Morristown, New Jersey, these elms have grown vigorously although more slowly than being distributed to several locations in the United States. Dr. Hirt, who has cooperated with the Federal Division of Forest Pathology, has recently received a few of these trees. Several of the trees will be planted at the Salina Street Forest Experiment Station, on the College campus, and on the Charles Lathrop Pack Demonstration Forest at Warrensburg, New York. Dr. Hirt will cooperate in studying the ability of these trees to adapt themselves to the conditions of the soil, climate, and fungus organisms in these locations.

—N. Y. State College of Forestry.

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Trees...

Chemotherapy of Dutch Elm Disease

By A. E. Dimond, J. G. Horsfall, and E. M. Stoddard

Connecticut Agricultural Experiment Station

During the past four years Dutch elm disease has struck harder than ever before. Not only has it continued to spread into new areas, but it has accelerated in its intensity in areas where it has long been established. This has proven true in areas where eradicative effort has continued as well as where it has not. The public has become more aware of the disease than ever before and has begun to wonder if the elm tree is to disappear as the chestnut did.

Fortunately two recent laboratory developments offer new hope for the fate of the elm. Through these the attention of the tree owner is becoming focused upon the healthy tree to be protected or upon the tree in early stages of infection for which there is some hope of cure, rather than upon the advanced cases which is already doomed to die.

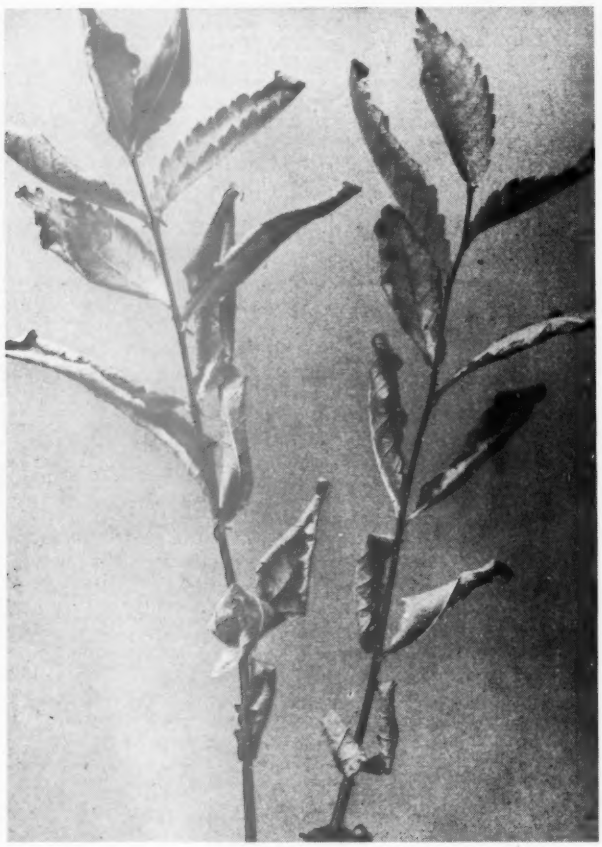
One new technique is the use of DDT sprays for control of the elm bark beetle, carrier of the disease. The Bureau of Entomology and Plant Quarantine of the USDA has obtained excellent preliminary results with it. These indicate that a healthy tree can be protected against the Scolytus beetle with reasonable effectiveness through a two-spray program. This development has been widely publicized and is being extensively tried this year.

A second development is the chemotherapeutic approach to plant disease control which has only recently begun to be explored experimentally. For the past eight years the Connecticut Agricultural Experiment Station has been experimenting in this field with particular emphasis on Dutch elm disease (1). This paper deals with the progress made on chemotherapy of this disease and some of the background research which has laid the foundation for it.

A characteristic of scientific research is that as it widens our knowledge it makes some concepts obsolete or obsolescent. Dutch elm disease research is now in a very fluid state. Tree owners and tree experts, must realize this and must expect to revise their thinking from time to time as new developments appear. Since the disease is striking so hard now, it seems desirable to inform the public of progress at frequent intervals, rather than to wait until all the "bugs" are out of new ideas for control of the disease. It is reasonably certain that practices used this year may be out of date by next year.

How Dutch Elm Disease Affects the Tree

Dutch elm disease is caused by the fungus, *Ceratostomella ulmi,* which lives and grows inside the sapwood, where it reproduces rapidly by means of bud cells. Infected wood soon becomes plugged by bud cells from the fungus, by tyloses formed by the infected wood, and by gums. Zentmyer, Horsfall and



Photos courtesy Connecticut Agricultural Experiment Station

Fig. 1—Elm twigs immersed in a sterile solution of toxin from a culture of Ceratostomella ulmi, cause of Dutch elm disease.

Fig. 2—Symptoms of true Dutch elm disease in a young tree which has been inoculated with Ceratostomella ulmi.

Wallace (1) have shown that diseased wood offers considerably greater resistance to the flow of water than healthy wood.

In addition to the mechanical obstructions in water-conducting cells, the fungus also produces poisons which become distributed throughout the plant, including the leaves. This further limits water movement. Zentmyer (2) and Horsfall and Zentmyer (3) noted that such toxins were produced in culture. The chemical nature of the toxin has been further studied and found to consist of at least two components (4). One of these is probably a polysaccharide, a starch-like chemical which has great affinity for water. When elm twigs are immersed in solutions of this toxin, they develop several of the symptoms of Dutch elm disease (See Figs. 1 and 2). In Figure 1 is a photograph of an elm twig which has been immersed in such a solution of toxin while in Figure 2 is a photograph of a small elm tree inoculated with Dutch elm disease and showing characteristic symptoms. There is no fungus present and no infection in the twig shown in Figure 1, but it is just as "sick" as the diseased tree.

A second toxin has also been isolated from cultures of the fungus, this one causing browning and dying of leaves. Its chemical nature is not known.

Probably other toxins are formed by the fungus in addition to these two. A group of Swiss workers has recently isolated a wilt-inducing toxin from the fungus causing tomato wilt, another vascular wilt disease (5). Wilting is a characteristic symptom of Dutch elm disease and it is not unlikely that such compounds are formed in the diseased elm.

We are rapidly approaching the point of view that it is the toxins in the tree which cause the symptoms of Dutch elm disease and that the fungus is important because it produces these toxins. Horsfall and Zentmyer (3) and Howard (6) have indicated that toxins formed by plant parasites may be counteracted by introducing into the trees chemicals which react with these toxins. This concept represents a new mechanism for chemotherapy of plant diseases, and has given fresh stimulus to such research.

The advance in the knowledge of the nature of toxins formed by vascular wilt fungi has made the problem both simpler and more complex. The problem is simplified under the old idea that but one toxin predominates for a given vascular disease. When that toxin is isolated and its chemical properties described, one can prescribe a chemical which will inactivate the toxin by reacting with it. But when it begins to appear that more than one toxin plays a major role in pathogenesis, the hope dwindles for disease control by toxin inactivation. If more than one toxin is active and these differ chemically, then as many chemotherapeutic agents as toxins may be required. To do this and obtain good distribution of each agent is less efficient and has less chances for success than attempting merely to inhibit the fungus itself. If it be true that more than one toxin is active in Dutch elm disease, it is probable that we shall have to abandon toxin inactivation as a *modus operandi* and return to the idea of inhibiting the parasite itself inside the tree. The number and nature of the toxins involved in a particular disease thus becomes critical and an active search for the answer to this question is underway.

The Chemotherapeutic Approach

A. The Search for Chemicals

Being an internal parasite, the fungus responsible for Dutch elm disease must be combated internally, which involves introducing chemicals into the water stream of the tree. Such chemicals must obviously be water soluble, of low toxicity to the elm and highly effective against the fungus or its toxins.

In 1940 a search began for chemicals which would act internally against the fungus causing Dutch elm disease and the results of this search have recently been published (1). Of considerable promise were such compounds as hydroquinone, p-nitrophenol and 8-hydroxyquinoline sulfate. All of these materials, when injected by gravity into the trunks of trees inoculated with diseases, reduced the symptoms of the disease. But the first two compounds mentioned often injured the elms, and the third one had too short-lived an effect. A group of compounds related to 8-hydroxyquinoline was then studied with the result that 8-hydroxyquinoline benzoate (also known as 8-quinolinol benzoate or oxyquinoline benzoate) became the center of attention. It appears to have a more long lasting effect than the sulfate, low toxicity to elms, and moderately good chemotherapeutic activity.

The chemical was tested further, with continuing good results, and was used on a commercial scale in 1946. Although oxyquinoline benzoate is the best chemical we have to date, it is not without fault. Some of its shortcomings are that its beneficial effect it still too short-lived, it reacts too readily with iron and other metals in the soil; it reacts with iron in spray tanks and connections on pumps where it could eventually produce serious corrosion. Selling presently for over $4.00 a pound in quantity lots, its cost is no small proportion of the cost of treating a tree. For these reasons the search for other materials is being continued on an accelerated scale. The years to come will most surely see the use of materials having longer activity and better properties for practical use.

Fig. 3 — Subsurface application of oxyquinoline bonzoate.

B. Methods of Application

Methods of injecting trees with chemicals have been reviewed by Muller (7) and by May (8). Chemicals in solution are readily taken up by the tree when introduced through bore holes from a bottle reservoir suspended on the trunk. However, distribution is very poor since the solution rises vertically from the point of injection with no lateral spread. Hence injection of trees by such a method requires many bottles or at least many bore holes through bark and cambium to attain satisfactory distribution of the chemotherapeutic agent. Since each wound makes a point of entry for other diseases, this method of treating the tree has been temporarily discarded.

A modification first described by Schwerieff (See May (8)), later used in "silviciding" trees during one stage of the Dutch elm disease eradication program, makes use of a funnel shaped collar around the trunk, so fastened to the trunk as to be water tight. This cone forms the reservoir for a chemical solu-

(Continued on Page 13)

Cleveland N. S. T. C. Sets Records (Heat)

By Paul E. Tilford

That the National Shade Tree Conference has developed into a large and forceful organization was well demonstrated when it met in Cleveland for the 23rd annual convention. The total registration was 645, the largest in the history of the conference. Thirty states, District of Columbia, Canada and Palestine were represented. The organization has become international. Outside the United States there are now members in Canada, South Africa and several European countries.

Pre-Convention Activities

On Monday, previous to the official opening of the conference on Tuesday morning, August 19, a choice of trips to places of interest in and near Cleveland were taken advantage of by many of the early arrivals. Two bus loads made the trip to Kent to visit the home office of the Davey Tree Expert Co.

In the afternoon the National Arborist Association, meeting in conjunction with the NSTC, discussed the reports of committees appointed to make a study of sales methods, union activities in the field of arboriculture, wages and prices, field methods and standards, business and accounting methods, safety, ethics and trade practices, and a training school.

A dinner for the commercial exhibitors Monday evening was an innovation for the conference. This was a jolly affair with some fine talent in the art of extemporaneous speaking being discovered. If a loving cup had been offered, Jim Shafer would have won hands down. The commercial exhibitors make the conference meetings possible. The arborists in purchasing supplies should remember this and patronize those firms who, year after year, support the conference by paying for exhibit space.

Dr. Donald Wyman, Horticulturist Arnold Arboretum, initiated the educational program Monday evening by an illustrated talk on plant materials at the Arboretum and in our national parks. As a photographer and speaker, Don ranks among the best. It is unfortunate that his colored illustrations cannot be reproduced in the printed proceedings.

Park Director Munson Opened Meeting

Park Director Arthur Munson, representing the mayor of the city of Cleveland, officially opened the 23rd National Shade Tree Conference Tuesday morning by welcoming the group to Cleveland.

All talks and discussions which appeared on the three and one-half days' program will be printed complete in the proceedings, which will be available about the first of the year.

Scene among the exhibitors at the 23rd National Shade Tree Conference in Cleveland during August.

Memorial Research Fund

In his report, Dr. Curtis May, chairman of the Memorial Research Committee, stated that during the past year contributions to the fund had been received from 24 members amounting to $1,115. The NSTC allocated $2,000 to the fund, making the total $3,115.

Dr. May pointed out the acute need for research on many shade tree preservation problems. The federal government and states cannot be expected to finance all needed shade tree research. Many industries support large research programs and such research pays off in dollars; otherwise it would not be continued. If the commercial arborists will get back of this effort and raise an adequate fund for research, then and only then, universities and other research institutions through grant-in-aid, fellowships, and scholarships can be induced to do more research on shade tree problems. Contributions to the research fund should be sent to the secretary of the conference.

Milwaukee in 1948

Milwaukee has been selected as the conference city in 1948.

If Milwaukee is as hot as Cleveland was, in all probability the 1949 conference will meet at the North Pole, otherwise it was tentatively decided to hold the 1949 meeting at Baltimore, Maryland.

Officers Elected

Dr. Curtis May, pathologist, U. S. D. A., Division of Forest Pathology, Beltsville, Maryland, was elected president for the ensuing year. Norman Armstrong, arborist, White Plains, New York, is the new vice president. Dr. R. R. Hirt, Syracuse University, was elected to the Nomenclature and Standards Committee for a term of two years and Noel Wysong, Cook County Forest Preserve, was elected to the same committee for one year to fill the unexpired term of A. Robert Thompson. The Executive Committee reappointed L. C. Chadwick, secretary, and Paul E. Tilford, editor.

Committee To Devise Tree Evaluation Formula

Norman Armstrong, in his talk on the National Arborist Association program, pointed out that none of the formulas suggested in the past are satisfactory for evaluating shade trees. He suggested that a combined committee be appointed from the National Shade Tree Conference and the National Arborist Association to devise an adequate formula. At the final business meeting, Friday morning, Roger Sohner, San Anselmo, California, moved that a joint committee for this purpose be estab-

(Continued on Page 22)

Arborists Training Program

By Rhodell E. Owens

Landscape Engineer
Pleasure Driveway and Park District
Peoria, Ill.

A group of future arborists studying under the direction of the Author in the Peoria program.

A new department of Landscape and Forestry was added to the Peoria Pleasure Driveway and Park District in July 1945. Several pressing problems led to this decision. The Park District has grown since its inception in 1896, to a large system of 2200 acres of parks and driveways, serving a population of 140,000 upwards. Funds which were once sufficient became increasingly inadequate as wages and commodity levels soared. Consequently, for many years prior to 1945, landscape maintenance was far short of actual needs.

To add to these difficulties, the War years produced still greater hardships. Finally, to crown this dilemma, phloem necrosis made its appearance in the City. Parks and boulevards that had previously been shabby in appearance, now became untenable. The Park Trustees now realized that something must be done if the people were to keep their parks in usable condition.

A citizens committee was appointed and after thorough study advocated that increased taxes would be the only answer. Accordingly, the issue was put before the people and a tax increase of two mills was voted to the Park District in the 1945 April election for a period of five years, thereafter to drop to a one mill increase.

In due course of time another citizens committee on forestry advocated that a department of landscape and forestry be set up, headed by a formally trained Recreational Forester or Landscape Engineer. It was with this in mind that the Park Trustees set up such a department and retained the author as Landscape Engineer and Forester in July 1945.

After study of conditions and needs, a definite appropriation was made for this department and actual operation as a department began in January 1946.

One of the immediate problems was the removal of trees which were fast becoming a public hazard and replacement of these dead trees with desirable species other than the afflicted elms. This demanded a tree crew which the Park District did not have.

After several months of futile efforts, three men were on the roll of this department, none of whom had any previous training or experience. Progress was painfully slow and it was plainly evident that some sort of in-service training was needed. In September 1946, the war suddenly ended and we were jubilantly hopeful that we would now be able to obtain experienced men. This we later found was not to be the case and we continued with an inadequate and inexperienced personnel.

In the latter part of July, in response to a call to the U. S. Employment Service, we were informed that no experienced men were available but that we could institute an *on-the-job training* program for veterans, if we so desired.

We were acutely aware from past experience with Governmental agencies that much red tape would be connected with such a venture and inquiries in the Chicago vicinity revealed that they had met with little success in setting up on-the-job-training programs.

After a number of weeks of search for experienced men, and in the meantime many promises of "no red tape" from the U. S. Employment Service, we decided to take a chance and the Trustees authorized a training course to be instituted.

First, since some landscape work of certain nature as well as tree work was to be performed by trainees in this particular program, a title conforming most closely to two government job listings was chosen, namely, Tree Surgeon and Landscape Gardener.

This course was next outlined in detail, stating the phases of training to be covered which we felt would be the minimum qualifications these men should have to competently perform duties expected of park arborists.

It was decided that two years or 4000 hours were needed for these men to complete the training for minimum qualifications. Distribution of training time divided as follows:

Landscape Gardening—1000 hours covering a six months period.

Arboriculture—3000 hours covering eighteen months period.

The above was broken into an equitable distribution of on-the-job activities.

Following is an outline of the related technical off-the-job training. Technical training is co-related to the activity in which the trainee is currently engaged

(Continued on Page 12)

A view showing the lifter used for making cuts on heavy logs as described in the text.

The Arborists Clinic

QUESTION: What, in your opinion, is the best reference textbook on diagnosis of tree insect injury and diseases. If available, from whom?

L. S. MacRobbie,
E. Patchogue, N. Y.

ANSWER: Clearly from a standpoint of diagnosis we do not know of a good reference book on the above subjects. Several books are available, however, and will have to do until the profession wakes up and makes an effort to publish "Arboricultural Series" as proposed in TREES (Vol. 7. No. 4). One of the finest books on diseases is the "Manual of Plant Diseases" (non-parasitic) by Paul Sorauer. This is out of print and can only be obtained through a dealer in old books.

Boyce's "Forest Pathology" (McGraw-Hill). Chester "The Nature and Prevention of Plant Diseases" (Blakeston Press). Herrick "Insect Enemies of Shade Trees (Comstock). Pirone "Maintenance of Shade and Ornamental Trees" (Oxford). Dodge and Rickett "Diseases and Pests of Ornamental Plants" (Jacques Cattell Press). Westcott "The Gardener's Bug Book" (Doubleday), and the proceedings of the National Shade Tree Conference.

The Editor.

QUESTION: Could you inform us how to obtain a book of pictures on various shade trees—colored or otherwise.

Samuel F. Nunes,
Chicago, Ill.

ANSWER: There are several excellent dendrologies available, but none in full color, and none devoted strictly to shade and ornamental trees. There are two books at present that stand out: "Knowing Your Trees" (American Forestry Association). Hough "Handbook of the Trees of the Northern States and Canada" (Macmillan), and Green "Trees of the South" (University of North Carolina Press); Harlow and Harrar "Textbook of Dendrology" (McGraw-Hill); Emerson and Weed "Our Trees" (Wise); Rogers "Trees" (Doubleday); McMinn "Manual of Pacific Coast Trees" (University of California Press).

The Editor.

Dear Ed:

I promised to send you some pictures and proof of the way in which I solved the bird annoyance in East Orange, which I believe is self-explanatory.

This morning I called Mrs. Sargeant, who resides at Linwood Place, to find out if the birds had returned this year, and her answer was that they hadn't returned.

As you will notice we tried all kinds of things, such as putting lengths of garden hose in various parts of the tree to resemble snakes, shot sky rockets, and a game-warden fired 100 shells into the tree and even went so far as to get twelve live cats from our Dog Warden and put these in the trees, only to be chased to the ground by many birds. We used 500-watt lights, powered by Home-Lite generators and this solved our problem.

Watching the starlings disperse from the effects of the high powered floodlights are, standing rear left, Harry E. Turner, City Forester, and Howard Voorhees of the East Orange Shade Tree Commission.

Will you kindly return the newspaper clipping and the letters so I can keep them for my scrapbook and file. If any other City Forester wants any further information, I will be glad to tell them more of my experiences.

Yours very truly,
HARRY E. TURNER,
Secretary.
Shade Tree Commission,
East Orange, N. J.

In Cleveland we had a starling experience recently. The methods used were different from those employed by Harry Turner and might bear repetition.

The birds had been nesting and messing on East 117th Street for 10 years.

We first placed a mounted owl in the tree, but possibly because it was not placed above the tree it did not seem to be effective. Having had an experience with "Birdsoff" (Destruxol Corp., Pasadena) in keeping pigeons off flower and insignia beds on the Public Square, it seemed like it might possibly work on the starling. We used our mist-duster and just at dark as the birds settled comfortably for the night we let them have it. They flew to the trees on the next street so we circled the block about four or five times until none remained. They did not return for about four days, then a few straggled back and in a week about a fifth of the original group had returned. We gave them another shot and to date they have not returned.

Dusting with "Birdsoff" is a fast, economic method and the noise of the blower, combined with the offensive properties of the dust seems to have done a nice job. Although the action was publicized in the paper we had no report of the birds nesting in some other neighborhood.

Edward H. Scanlon,
Commissioner,
Division of Shade Trees,
Cleveland, Ohio.

GUYING SMALL TRANSPLANTED TREES

It has long been an established fact that upright braces for small tree guying (trees under 4 inches) in public places are safer to use than wire and pegs.

We also find that maintenance is greatly reduced and that we obtained sturdier guying.

During late years it has been virtually impossible to obtain a good quality wood stake and when available were almost prohibitive in cost. We finally decided

to buy steel fence posts for guying. We find these posts can be reused many seasons, they are neat in appearance, are stronger than wood and above all they are economical. A 7-foot studded-tee steel post runs only a few cents higher than the cost of a wood post. Wood will not last more than several seasons, whereas steel, we judge, will last at least 10 years, bringing annual cost down to 8 cents a year per post.

Steel posts can be driven and pulled easily by a simple arm and post jack. The flange on the steel post greatly reduces loosening and pulling over during wet ground condition.

RHODELL OWENS
Peoria, Ill.

ODDITREES

Photo courtesy Richard R. Fenska

This tree first appeared in Dick Fenska's book the "Tree Experts Manual." It is an apple tree in-arched with five seedlings which were planted around its badly decayed base, then after they had become established they were grafted on to the sound part of the trunk. The base of the trunk decayed giving the appearance of a tree on stilts.

During the 1941 blitz on London, engineers found wood frame buildings standing amid the wreckage of stone, concrete and steel structures.

Timbers installed temporarily to support weakened masonry walls in a canal at Bristol, England, are still in place after 100 years.

ESSENTIAL ELEMENTS IN TREE NUTRITION

By J. F. Wischhusen
Manganese Research and Development Foundation, Cleveland, Ohio
(Part 2)

Deficiency Symptoms

Deficiencies that have been observed on nut trees are the so-called "little leaf" or "rosette" of pecans and black walnuts (14), which is due to a lack of zinc. Strangely enough, healthy orchards in this case contained a preponderance of fungi, whereas in affected orchards the soil microflora was predominantly bacterial (15).

We now have definite experimental evidence that lime, manganese and zinc are required in appreciable quantities for the growth, health and bearing quality of nut trees. It is well to make sure of these elements in the soils devoted to nut tree planting, but it cannot be emphasized too often that *all essential elements and factors* should be taken care of; any one of them may be the limiting factor in crop failure; the one that is absent is always the most important.

In regard to inorganic nutrients, more attention has probably been devoted to citrus trees than any other tree species, largely because the soils of Florida and California require additions thereof. It would be unfair to say that such main fruit crops such as apples, cherries, peaches, plums have been neglected; we merely possess more information on the nutrition of citrus trees than on other tree crops, as far as the micro essential nutrients are concerned. Most orchards and groves are fertilized only with nitrogen, phosphorus and potash, and limed when necessary. Nitrogen can stimulate size of fruit at the expense of quality.

A paper by P. W. Rohrbaugh (16), Plant Physiologist of the California Fruit Growers Exchange, Ontario, California, deals with eleven mineral nutrient deficiencies and their causes, viz: calcium, magnesium, potash, phosphorous, sulphur, nitrogen, iron, boron, zinc, manganese, copper, and this might well be used as a guide for nut trees.

6—*Miscellaneous.*

A few oddities may also be mentioned for anyone inclined to experiment:

From Holland it is reported that an avenue of large handsome shade trees close to a century old, all died in one year, except there where a junk dealer had stacked a pile of old metals. The trees had exhausted the inorganic nutrients within reach of their roots in the soil, but the junkpile had replenished them sufficiently, so that those within reach of it kept alive to this day, twenty years later.

A rock mulch is reported to have improved the growth of lime and lemon trees considerably (17) and it would seem that similar experiments should be made on young nut trees, just before bearing age in a comparative test with a check planting. Stones can be selected for the nutrients they contain, and a geologist can easily point out those containing the greatest number of elements. No one could go wrong in placing a few rocks of limestone or dolomite near the base of a tree, and let rain and sunshine, heat and frost attend to the fertilizing in a slow but perpetual manner.

Maple sugar contains manganese (18), showing this as a distinct quality over cane usgar. Manganese and other essential nutrients are known to facilitate the production of proteins (19), and the question of better quality nut production may well be examined from the viewpoint of the indirect effect from activities of soil microbiology by manganese, copper, cobalt and zinc. Some of these elements have also been classed as inorganic plant hormones (20). "Chlorosis," the yellowing of leaves, may not only be a deficiency symptom of manganese, but also one of iron, copper and magnesium. Lack of manganese can cause a decrease in photosynthesis (21), so much so that in manganese deficient leaves the CO_2 assimilation may be reduced to half of normal. Herein, too, may lie the cause of low yields, smaller roots and lowered resistance of those roots to invading detrimental organism.

Contemporary work on soil microbiology may show that manganese and other essential nutrients are perhaps most important in their functions for the preservation and balancing of microbial life and actions in soils. There is where tree nutrition must begin; whatever is neglected in soils can at best only temporarily be adjusted afterwards. After all, deficiency symptoms on foliage show lack of soil fertility, and whilst we should welcome them for their diagnostic value, our corrective measures to be most economical must be taken on soils.

Transmission of Inorganic Nutrients from Soils to Plants to Animals

Soil analysis and plant tissue tests both have their value, but also their limitations. Many laboratories and experiment stations are equipped to make rapid soil tests, and some engage in leaf analysis. It is important that they be correctly interpreted. For instance, at the Citrus Experiment Station, Riverside, California (22), bark and leaves were collected from healthy and diseased Persian Walnuts. They were analyzed for calcium, magnesium, inorganic phosphate, manganese and iron. A higher percentage of ash was found in the diseased than in the healthy bark, and cal-

cium, manganese and inorganic phosphates were also generally higher.

It would be a fallacy I think to conclude therefrom that these elements were not necessary, or were present to excess. They were probably present because they had failed to function properly, due to changes in weather, excessive rains or droughts, and could not eliminate themselves.

We must consider the *results from the functions* of the essential elements, and discard the popular belief that inorganic nutrients in soils are transmitted from soils in plants, and therein contained for the express purpose of satisfying the need of animals and humans (23).

The plant has only one purpose to perform which is to grow and to reproduce itself, and such is the case with all other forms of life.

Plants contain very often inorganic elements in a form in which they cannot be utilized. It is therefore quite easy to mistake their presence either as a toxicity symptom or as a high rquirement, when as a matter of fact these elements are present due to conditions unfavorable to metabolism, and they remained in bark and leaves as end products, in an inert form. Rather than being transmitted from soils to plant, their functions may consist of the formation of enzymes, proteins, hormones, chlorophyll, antibodies, vitamins, in carbon assimilation. When they have served such purposes they are not likely to be present in plants in anything like the amounts or forms as present in soils. They may come into question as catalysts or bio-catalysts, as sources of energy for microorganism, from which their optimum effects have been secured when they are not transmitted at all, causing changes, but remaining themselves unchanged. They are essential in the sense that the elements composing soils, sea, atmosphere are constantly energized, changed and used over and over again to create plant, animal and human life. In this cycle nothing is lost, only changed from old to new generations.

Summary

Soil factors for tree growth are physical, chemical and biological. To control the organism of soils and plants is probably the most difficult problem in micro biology. It is not wise to alternate neglect with feverish attention when blights or other pests become epidemic or threatening. They may be of a nutritional, preventable rather than curable nature. Pathology and tree nutrition may as well become a constant part of your activities.

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Training Program

(Continued from Page 9)

1. LANDSCAPE GARDENING.
   - A. General Elementary Botany Lessons.
   - B. Lawn Establishment and Care.
     - (1) Soil types—chemical composition, etc.
     - (2) Soil drainage
     - (3) Seeding
     - (4) Sodding
     - (5) Lawn maintenance
   - C. Shrub Planting and Care.
     - (1) Identification of common types—ultimate size—color—bloom, etc.
     - (2) Types for certain locations
     - (3) Methods of digging
     - (4) Methods of planting
     - (5) Shrub maintenance
   - D. Vine Planting and Care.
     - (1) Identification of common types
     - (2) Methods of climbing, bloom, etc.
     - (3) Types for various locations.
     - (4) Preparation of plainting bed
     - (5) Vine maintenance
   - E. Flower Planting and Care.
     - (1) Identification of common annuals and perennials
     - (2) Methods of propagation in greenhouse and hotbeds
     - (3) Methods of preparing seed bed
     - (4) Planting procedure
     - (5) Manner of watering
     - (6) Manner of cultivation
2. ARBORICULTURE.
   - A. Tree Removing.
     - (1) Methods of topping out and lowering limbs
     - (2) Undercutting of falling tree
     - (3) Use of axe, regular foresters

(Continued on Page 18)

Chemotherapy

(Continued from Pafe 7)

tion. Under the solution a series of chisel-cuts are made around the tree. This method was likewise discarded on two counts. To make the collar water tight around the trunk is too time consuming. While uptake of solution is somewhat more rapid because cuts are made under solution, thus eliminating air-lock in the vessels, distribution of solutions in the tree is still poor and wounding is extensive. Anyone seeing silvicided elms can appreciate how incomplete was the distribution of copper salt in the tree, because only parts of the tree were killed in many cases.

Introducing the dry chemical into bore holes, either by inserting the chemical directly or in large gelatin capsules has likewise led to poor distribution in the tree, there being no lateral spread from the bore hole. In addition, unless the chemical is freely soluble in water, solution is very slow. Oxyquinoline benzoate, having properties similar to plaster of paris, sets to a pellet on becoming moistened and has been found unabsorbed after a year in the tree. Because of its greater solubility in water, oxyquinoline sulfate is readily dissolved and absorbed. The gelatin capsule is more hindrance than help since it tends to plug the wood, thus preventing distribution of the chemical.

In his chemotherapeutic research on X disease of peach, using reservoirs of solution attached by rubber tubing to the decapitated ends of twigs, Stoddard (9) has obtained much more uniform distribution of chemical in small trees than is given by any of the above methods. However, such a method is impractical for commercial use on elms.

Both Zentmyer (1) and Stoddard (10) have applied solutions of oxyquinoline benzoate to the soil for control of Dutch elm disease, and judging by the response of the trees, have obtained absorption of the chemical through the root system and tree more or less uniformly. This method leads to satisfactory distribution of chemical through the tree (1) if the chemical is absorbed by the plant and (2) if it is not absorbed and held by the wood near the point of uptake. Many dyes are fixed by wood, and chemicals like this could never be successfully distributed in a tree. Moreover soil application of solution introduces two further complications. (a) One cannot tell how much the tree takes up, but under the best of conditions, much of the chemical is wasted; and (b), many chemicals promptly react with components of the soil so that the treatment is valueless or at least wasteful. Soils being so highly variable, there is always the possibility that failure in any locality is due to reaction of the chemical with the constituents of a particular soil.

A case in point is that of hydroquinone, mentioned in the previous section as a chemical found promising in preliminary work as a chemotherapeutic agent. Hydroquinone is rapidly oxidized in the soil to quinone and one can be certain that less than one per cent of the compound applied in solution to the soil remains unchanged before absorption by the plant. What is absorbed is oxidized in the roots before it ever reaches the trunk of the tree. This fact seriously limits the number of chemicals that can be applied to the soil.

Despite all of this, soil application of solutions over the feeding roots is the method now being used extensively in our tests. Response of diseased trees is greater than by any method of introducing chemicals previously used. Several modifications of this procedure are possible and they are currently being compared.

1. The chemical is sprinkled as a dry powder on the surface of the ground over the feeding root area and immediately and thoroughly watered into the soil with the garden hose. Here there is the problem of injury to lawn grass or plantings under the tree. With oxyquinoline benzoate, this has been noted

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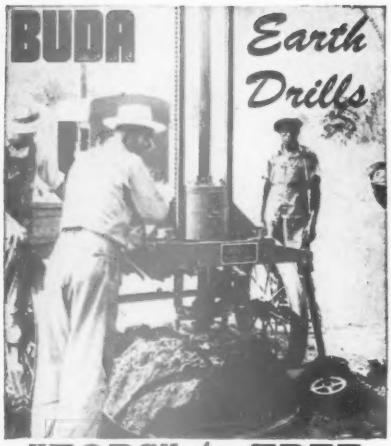

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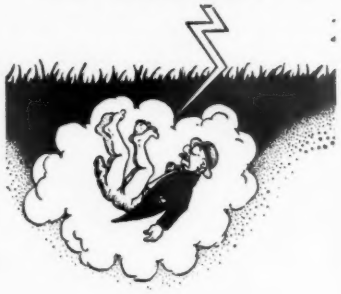

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in a few cases, but where adequate watering is done immediately after application, lawn injury has been confined to a slight browning which soon disappears. When left dry on grass, the lawn is killed. This method is rapid and simple, but unless watering is thorough, the chemical may not dissolve or may be rendered inactive in the soil before it reaches the roots.

2. The chemical is applied in saturated solution (in the case of oxyquinoline benzoate, 1 part in 1,000 parts of water or 13 ounces in 100 gallons water) to the surface of the ground over the feeding root area. Here the solution must permeate the soil as far as the root, and if reaction of the chemical with soil occurs much of it will be wasted.

3. It is introduced 18 to 24 inches below the surface of the ground through the use of high pressure guns such as are used in liquid feeding of trees, by spacing injection holes in the soil as in fertilization (Fig. 3). This would seem a preferable method, since the solution is introduced as close to the root surface as is physically possible, thus minimizing the chances for reaction of chemical with soil and eliminating waste. If applied at pressures in excess of 300 pounds per square inch and in sufficient volume of water in a soil of uniform texture, complete saturation of the soil is obtained, as anyone using such a nozzle for liquid fertilizing of trees can testify.

Even should soil application of chemicals prove ideal, another method of applying materials must be developed for the street tree with pavement covering its roots either partially or completely. Progress is being made along another line, using a trunk injection method whereby the solution is forced into the trunk under pressure. Preliminary results indicate that distribution of chemicals is fairly uniform.

Results of Treatment With Oxyquinoline Benzoate for Dutch Elm Disease

Experimental results have been reported in the past as work has progressed (1, 3, 10, 11, 12). The following results are typical (12). In 1946, a plot of 200 elms, ranging in size from 2 to 8 inches DBH was divided in half. Half of the plot was watered with water alone, constituting the check. The other half was treated with oxyquinoline benzoate solution in water at a strength of 1 in 1,000. This solution was pumped through a commercial sprayer onto the surface of the ground over the feeding roots of the trees, at the rate of 5 gallons of solution per inch diameter of tree DBH. Immediately on completion of this operation, all trees were inoculated with Dutch elm disease.

Trees were inoculated in the most

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severe manner conceivable. Into the trunk of each tree an axe cut was made into the sapwood and from 1 to 2 billion bud cells of the casual fungus poured into this cut in water suspension. It is no wonder that a week later all but a very few of the trees were showing severe symptoms of Dutch elm disease.

Three weeks after inoculaton, each tree in the plot was rated for the percentage of the crown involved by Dutch elm disease. The treated half of the plot averaged 27 per cent involvement, while the check half averaged 49 per cent. Statistically this difference was highly significant.

These trees were inoculated early in August. One month later, each tree was sampled and cultured for the casual fungus. For practical purposes, there was no difference between treated and untreated halves of the plot with respect to the number of infected trees; it may be concluded that treatment did not prevent infecton and did not kill out the fungus put into the trees. Treatment did alleviate symptoms; treated trees suffered less from the disease than did untreated ones.

By mid-September leaves had almost completely fallen from the trees in the untreated half of the plot whereas leaves in the treated half were retained until the normal time for leaf fall.

Despite the fact that there was a difference between treated and untreated halves of the plot, trees in the treated half averaged 27 per cent crown involvement. This represents a ruined tree to the tree owner. Such heavy involvement may be a result of inadequate protection, but is also due in part to the severity of the inoculation. That such a difference existed under as severe conditions as could be provided, clearly indicates positive benefits from treatment. Such inoculation is many times more severe than in nature and it is logical to believe, until we have evidence to prove otherwise, that trees inoculated as they are in nature would show even wider differences between treated and untreated than did trees in the above plot. It is certainly logical to assume that treated trees inoculated as in nature would not show such marked symptoms so soon.

What has been said indicates that the method is experimental. A few healthy trees treated with oxyquinoline benzoate have contracted the disease by now. A few diseased trees have continued to decline despite treatment. In general, progress of the disease seems slower in a treated tree than in an untreated one. But treatment does not eliminate the fungus from the tree and does not appear to prevent infection.

We are just beginning exploration of the domain of control of plant disease by chemotherapy. There is much to learn and time alone can give us the answers to the myriads of questions which must be answered.

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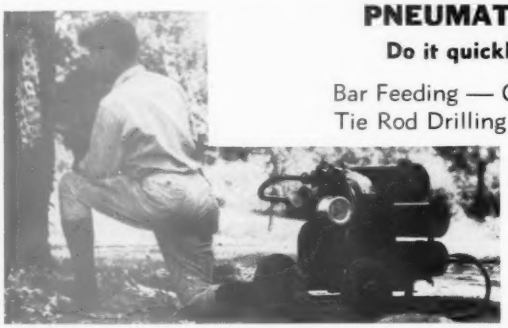

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Cover Picture

In a photographic contest conducted by the N. S. T. C., the first of its kind in the history of the Conference, three prizes were awarded the winners. The judges, Arthur L. Munson, Director of Parks and Public Properties, City of Cleveland, and Arnold M. Davis, Director of the Greater Cleveland Garden Center, awarded first prize to Carl Fenner of Lansing, Michigan, for his efforts which is shown on the cover of this issue.

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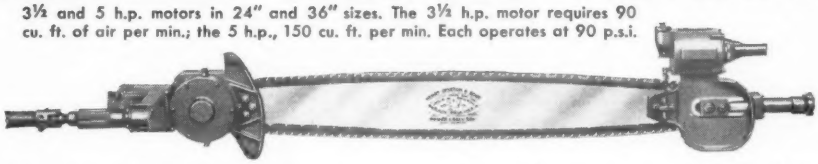

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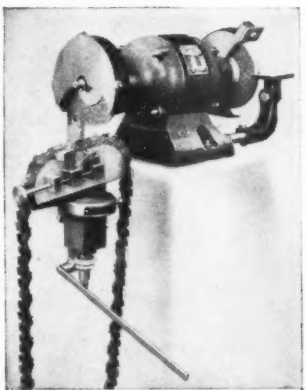

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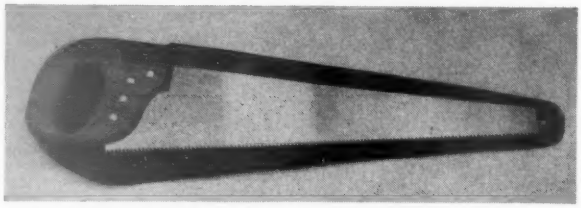

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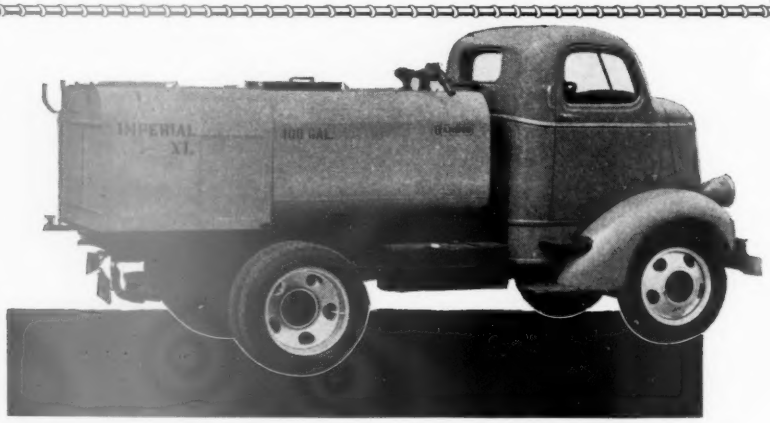

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(2) Influence of light on growth
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(4) Essential pruning
(5) Ropes, knots and methods of climbing
(6) Pruning procedure
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D. Tree Spraying.
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Naturally, only the fundamental working information is taught as one can readily see the hopelessness of presenting such a great mass of detail in 288 hours of course work.

Upon presenting the above program to the State Board for Vocational Education, the approving agency for such training programs, we were informed that immediate approval had been granted and that participating veterans were further entitled to class room instructions in subjects directly related to our training phases. Further investigation revealed that the writer's educational qualifications were such that he could conduct such class work for the vocational school. Such arrangements were made, two evenings of the week set aside for such class work. In cooperation with the Peoria Board of Education, Vocational Division, our related program has been functioning on the above outlined schedule since September 1946. Due to crowded conditions at the Peoria Vocational School, class room facilities were set up at the Park District administration building.

Regular lectures and examinations lead to a certificate of *Assistant Arborist* to veterans fulfilling requirements. Material is presented by phases with an effort made to make each phase a complete subject so that incoming veterans may fit into the course at any time.

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Up to $50.00 worth of text books and expendable materials are furnished each man per year of training and small tools for training purposes were also approved which were deemed necessary by the training agency and approved by Regional Veterans Administration. We found that we were one of the first agencies asking for a training kit and our list has now been set up as standard for the Region.

Contrary to promises, a certain amount of irritating "red tape" was necessary, although not as much as we had anticipated. Our two main objections are the slowness of Government subsistance payments and training tools reaching the veterans.

Our greatest blow to the program came when the single man's total pay was reduced to $175.00 per month. This has created an unwarranted hardship on the single man and we are hopeful that it will be revised soon.

We have nearly completed our first year of intensive training. It has been hard and painstaking work but we can now enthusiastically say the program is bringing the desired results. It gives us the great advantage of picking our men by general aptitude and intelligence and eliminates the choice based upon vague and often misrepresented past experience. We can recommend the program to park districts similar to that of Peoria as a fully workable one.

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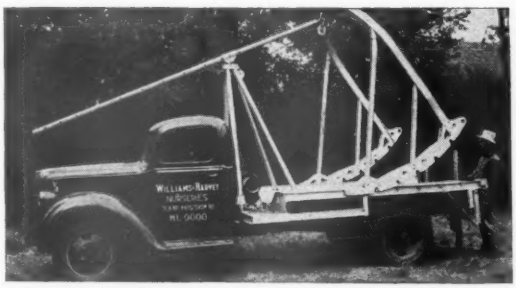

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NAA NEWS

By Paul E. Tilford, *Secretary*
Box 426, Wooster, Ohio

National Arborist Association Officers

Officers elected for the ensuing year at the recent meetings of the National Arborist Association held in conjunction with the 23rd National Shade Tree Conference in Cleveland were as follows: President, Karl Kuemmerling, Canton, Ohio; first vice president, Albert W. Meserve, Danbury, Connecticut; second vice president, C. L. Wachtel, Wauwatosa, Wisconsin, and director for a term of three years, Kenneth B. Flaig, Fort Wayne, Indiana. Directors whose terms of office carried over from the previous year are: C. M. Blume, Houston, Texas, and R. D. Lowden, Needham, Massachusetts.

The association voted to hold its next meeting somewhere in the south this coming winter.

Leader of a small birch tree showing extreme fasciation.

Fasciation

A peculiar disease or deformation sometimes appears at the tips of branches or leaders of shade trees. The stem is flattened, often curved and the leaf arrangement may be entirely different than on a normal stem of the species. Both conifers and deciduous trees may show this peculiarity.

The cause of fasciation in all instances is not known. It is thought to be due to some physiological disturbance within the bud from which the fasciated shoot grows. In herbaceous plants some types of fasciation are caused by a bacterial infection but this has not been proven in the case of trees.

Fasciation is of no great importance. Usually when the deformed shoot is removed, normal growth will develop from a lateral. The disease is interesting especially when observed for the first time.

Trees Across the Country

The above normal rainfall over a large section of the United States this season had been very favorable for tree growth. Foilage has been heavy and the length of branch extension unusual. In many places some oaks and certain other trees were still producing new growth the middle of September.

Insect injury from leaf eaters, such as cankerworms, has been light in most places. Red spider mites on evergreens and other plants, in spite of the wet weather, were numerous. Perhaps the entomologists have an explanation. We have always believed that red spiders thrived best during hot dry periods. Maybe so, but they were bad this year and in locations where is wasn't exactly dry.

Anthracnose on oak, particularly white oak, and sycamore was especially severe. Many of these trees were almost defoliated and produced a second crop of leaves. Apple scab was rampant and early infection did not appear to be severe, but secondary spread was terrific and many apple trees defoliated because of scab. This was a difficult year to control scab even though the complete schedule of sprays was applied.

Phloem necrosis of American elm in epidemic proportions continued in cen-

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tral and southern Ohio and in that general section. In St. Louis and Kansas City where the disease has been present now for several years, some trees died early in the summer because of this disease, and then when the hot weather of late July and August arrived the disease made more headway.

Dutch elm disease has increased greatly in northeastern Ohio. It is well established now in Cleveland in the same areas where it was first discovered in the U. S. in 1930. The thorough eradication program which followed the discovery of the disease in Cleveland eliminated it from that small isolated area of infection. Now after 17 years the disease has come back in and probably this time it will stay.

Trips during the summer extending from Kansas City to New York, and as far south as the Carolinas have revealed that on the whole 1947 was a favorable year for shade trees. While good for the trees, the abundant rainfall made the arborist's work difficult. Bogged down trucks, inability to complete spraying jobs on time, the revision of work schedules because of rains, etc., have been common headaches. Such a season requires more aspirin than a normal year.

Arborist Becomes Parrot Tamer

In answer to a telephone call from Mrs. Frank D. Warren, 1255 Lake Forest Blvd., Jacksonville, Florida, for help in recapturing her 22-year-old parrot, Farrens Tree Surgeons sent Foreman John Stafford and a helper to see what could be done.

Sure enough, Polly was out of the cage and perched high in a nearby tree.

Stafford took the cage into the tree. After two hours of coaxing and threatening in a dialect comprised of both parrot and tree climber language, he had the bird safely back in the cage. The appreciative owner gladly paid cash on completion of the job.

Farrens Tree Surgeons has appointed Stafford the "Official Parrot Tamer" of their organization.

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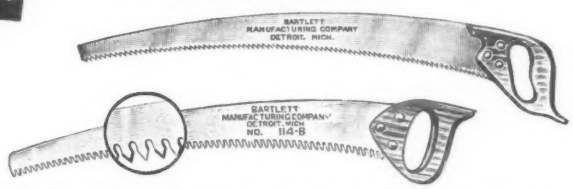

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Authors and Books

The following books may be ordered from TREES Magazine, Box 5607, Cleveland, Ohio.

I PLANTED TREES, by Richard St. Barbe-Baker. Lutterworth Press, 35 John St., London, 262 pp. illus., 10s. 6d (about $3.00).

This is a charming story of a crusade for trees around the world by the famous founder of England's Men of the Trees Society.

Mr. Baker takes you around the world in this book, with a memorable stop in the Redwoods. This introduction to these immortal trees resulted in the acquisition of a grove of coast redwoods that has been dedicated as the Men of the Trees Grove.

The story of forestry and of tree planting in the far reaches of the British Empire are told in a most interesting manner. It is a story well worth a place in your collection—a story you will thoroughly enjoy.

THE ARBORETUMS AND BOTANICAL GARDENS OF NORTH AMERICA, by Donald Wyman. The Chronica Botanica Co., Waltham 54, Mass., 100 pp. illus. $1.50.

For the man who travels much, or for the vacation traveller, who wishes to visit a famous garden or arboretum along the route, this book will prove to be a valuable guide.

Each entry is treated on the basis of Chief Function; Featuring; Species and Varieties; Ownership; Endowment; Admission; Director; Library; Special Events; References.

An addendum of discontinued projects and proposed ones helps to make a valuable reference.

The winners of the dance contest at the 23rd NSTC in Cleveland were Mrs. H. H. Erwin of Roanoke Rapids, N. C., and the smiling gentleman with the curly locks, the other half of the winning team, is our well-known tree moving friend, Jean Butts of Cato, N. Y.

N. S. T. C.

(Continued from Page 8)

lished. The motion was carried and referred to the officers and executive committee of the two organizations.

Let There Be Thanks

No one except those who have served on local committees for staging National Shade Tree Conference meetings appreciates the amount of work that goes into one of these meetings. The local committee for the 23rd annual meeting, under the leadership of President Charles F. Irish, deserves our most sincere thanks. Ed Scanlon, city forester of Cleveland, editor of TREES Magazine and manager of the 23rd conference did a swell job. Charley ate a gross of aspirin and Ed had to take a vacation when the meeting was over.

Now that it is a thing of the past and we have all profited and will continue to benefit by it, our job is to push on to bigger and better things in shade tree preservation.

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it takes years to grow a tree

Fine shade trees are the result of years, even centuries, of slow and deliberate growth; and like this very growth the accumulation of scientific knowledge and its practical application to the care of shade trees is a process of years. No one person, group or company, within one or even many lifetimes, can more than scratch the surface of the science of tree care. As it takes years to grow a tree, it takes a lifetime to study the tree and accumulate data about its growth. Again, the results of study vary from section to section of the country and the world.

As years of work pass we realize more and more the vastness and continuousness of this never-ending search. We of the Bartlett organization have worked diligently for years and yet, even with the facilities of our Laboratories and Experimental Grounds, dedicated to acquiring knowledge for the benefit of all concerned with shade tree care and with our grants to a number of colleges and institutions for fellowships and for the study of many special problems, we realize that our contribution has been but small indeed in comparison with the overall knowledge that must be acquired. It is only when our work is added to the wealth of scientific achievement brought about by other scientists and tree men, to whom the country owes a great debt of gratitude, that we can visualize the steady and encouraging accumulation of information through which all may benefit.

It is our sincere desire that the cooperation we gladly extend to the entire shade tree industry may continue to lend a helping hand for many years to come. Our knowledge is for all; we wish all to take advantage of our findings, and through the cooperation of all, working together, still greater strides may be made in the field of scientific tree care.

Sincerely,

The F. A. Bartlett Tree Expert Co., Stamford, Conn.